(a) For a gas-fired commercial warm air furnace with capacity of 225,000 Btu per hour or more, the thermal efficiency at the maximum rated capacity must be not less than 80 percent.

(b) For an oil-fired commercial warm air furnace with capacity of 225,000 Btu per hour or more, the thermal efficiency at the maximum rated capacity must be not less than 81 percent.

§ 431.703 Small and large commercial package air conditioning and heating equipment.

Each commercial water- or evaporatively-cooled air conditioner and water-source heat pump manufactured after October 29, 2003 (except for large commercial package air-conditioning and heating equipment, for which the effective date is October 29, 2004) must meet the applicable minimum energy efficiency standard level(s) for heating and cooling set forth in Tables 1 and 2 of this section.

Table 1 - Minimum Cooling Efficiency Levels

Product	Category	Cooling capacity	Subcategory	Required Minimum Efficiency Level [1]	Effective Date
Small Commercial Packaged Air Conditioning and Heating Equipment	Water-Cooled, Evaporatively Cooled, and Water-Source	<17,000 Btu/h	Air Conditioners	EER: 12.1	10/29/2003
			Heat Pumps	EER: 11.2	10/29/2003
		≥ 17,000 Btu/h and <65,000 Btu/h	Air Conditioners	EER: 12.1	10/29/2003
			Heat Pumps	EER: 12.0	10/29/2003
		≥ 65,000 Btu/h and <135,000 Btu/h	Air Conditioners	EER: 11.5[2]	10/29/2003
			Heat Pumps	EER: 12.0	10/29/2003
Large Commercial Packaged Air Conditioning and Heating Equipment	Water-Cooled, and Evaporatively Cooled	≥ 135,000 Btu/h and <240,000 Btu/h	All	EER: 11.0	10/29/2004

Table 2 - Minimum Heating Efficiency Levels

Product	Category	Cooling Capacity	Subcategory	Required Minimum Efficiency Level[3]	Effective Date
Small Commercial Packaged Air Conditioning and Heating Equipment	Water-Source	<135,000 Btu/h	All	COP: 4.2	10/29/2003

[1] All EER values must be rated at 95°F outdoor dry-bulb temperature for air-cooled products and evaporatively-cooled products and at 85°F entering water temperature for water-source and water-cooled products.

[2] Deduct 0.2 from the required EER for units with heating sections other than electric resistance heat.

[3] All COP values must be rated at 70°F entering water temperature for water-source products.

§431.704 Commercial water heaters and unfired hot water storage tanks.

Each commercial storage water heater, instantaneous water heater, and hot water supply boiler manufactured after October 29, 2003 must meet the applicable energy conservation standard level(s) as follows:

Equipment Type	Category	Size or Rating	Energy Efficiency Descriptor	Required Energy Efficiency Level[1]	Effective Date
Gas Storage Water Heaters	< 4,000 Btu/hr/gal	≤ 155,000 Btu/hr	Min. Thermal Efficiency	80%	10/29/2003
			Max. Standby Loss[2]	$Q/800 + 110\sqrt{V_r}$ (Btu/hr)	10/29/2003
		> 155,000 Btu/hr	Min. Thermal Efficiency	80%	10/29/2003
			Max. Standby Loss[2]	$Q/800 + 110\sqrt{V_r}$ (Btu/hr)	10/29/2003
Gas Instantaneous Water Heaters	≥ 4,000 Btu/hr/gal	≥ 10 gal	Min. Thermal Efficiency	80%	10/29/2003
			Max. Standby Loss[2]	$Q/800 + 110\sqrt{V_r}$ (Btu/hr)	10/29/2003
Oil Storage Water Heaters	< 4,000 Btu/hr/gal	≤ 155,000 Btu/hr	Min. Thermal Efficiency	78%	10/29/2003
			Max. Standby Loss[2]	$Q/800 + 110\sqrt{V_r}$ (Btu/hr)	10/29/2003
		> 155,000 Btu/hr	Min. Thermal Efficiency	78%	10/29/2003
			Max. Standby Loss[2]	$Q/800 + 110\sqrt{V_r}$ (Btu/hr)	10/29/2003
Oil Instantaneous Water Heaters	≥ 4,000 Btu/hr/gal	< 10 gal	Min. Thermal Efficiency	80%	10/29/2003
		≥ 10 gal	Min. Thermal Efficiency	78%	10/29/2003
			Max. Standby Loss[2]	$Q/800 + 110\sqrt{V_r}$ (Btu/hr)	10/29/2003
Gas Hot Water Supply Boilers	≥ 4,000 Btu/hr/gal	≥ 10 gal	Min. Thermal Efficiency	80%	10/29/2003
			Max. Standby Loss[2]	$Q/800 + 110\sqrt{V_r}$ (Btu/hr)	10/29/2003
Oil Hot Water Supply Boilers	≥ 4,000 Btu/hr/gal	≥ 10 gal	Min. Thermal Efficiency	78%	10/29/2003
			Max. Standby Loss[2]	$Q/800 + 110\sqrt{V_r}$ (Btu/hr)	10/29/2003
Unfired Hot Water Storage Tanks	All	All	Minimum Insulation Requirement	R-12.5	10/29/2003

[1] Standby loss is based on a 70° temperature difference between stored water and ambient requirements. In the Standby Loss equations, V_r is the rated volume in gallons, and Q is the nameplate input rate in Btu/h.

[2] Water heaters and hot water supply boilers having more than 140 gallons of storage capacity are not required meet the standby loss requirement if the tank surface is thermally insulated to R-12.5, if a standing pilot light is not installed, and gas- or oil-fired storage water heaters have a flue damper or fan-assisted combustion.

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December 26, 2000

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Sec.

Subpart A—Administration and Enforcement—General